Common Aviation Command and Control System (CAC2S)

Program Update
August 13, 2002

Marine Aviation C2 Capability

Existing MACCS Agencies

TAOC

TACC

DASC

LAAD C2

MATCALS

Existing and Future Capabilities

TBMCS

SENSORS

TADILS AFATDS

MSBL

GCCS

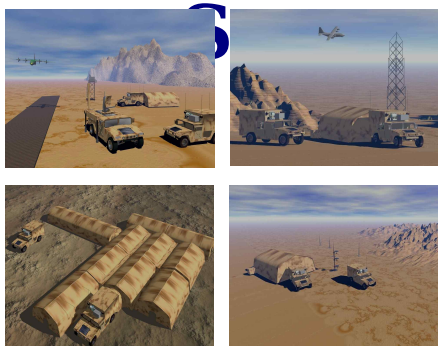
GBS

CEC

COMMUNICATIONS

DII COE

CAC2



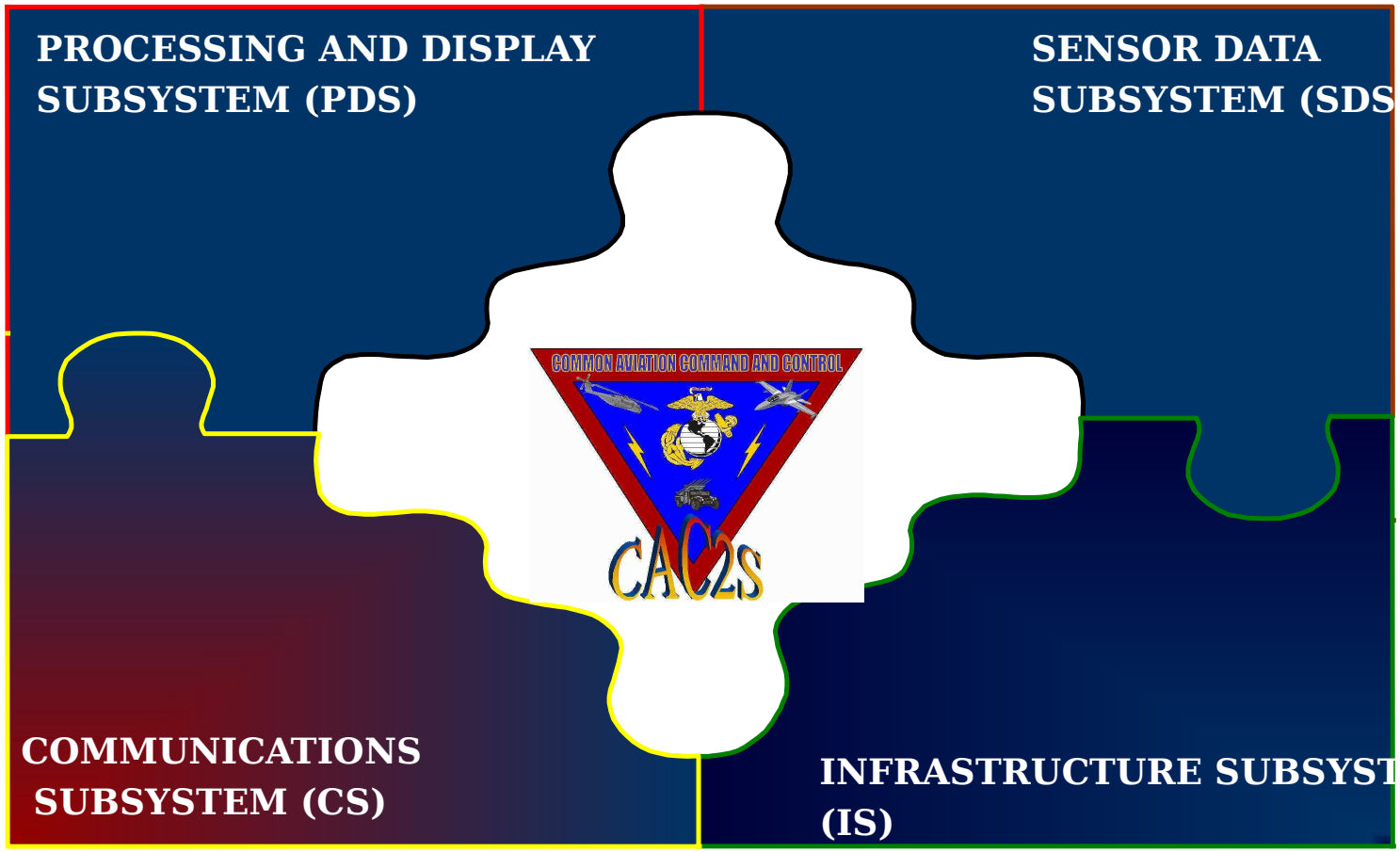
PROCESSING & DISPLAY

COMMUNICATIONS

SENSORS/WEAPONS INTERFACES

FACILITY INFRASTRUCTURE

CAC2S "PILLARS"



CAC2S Background

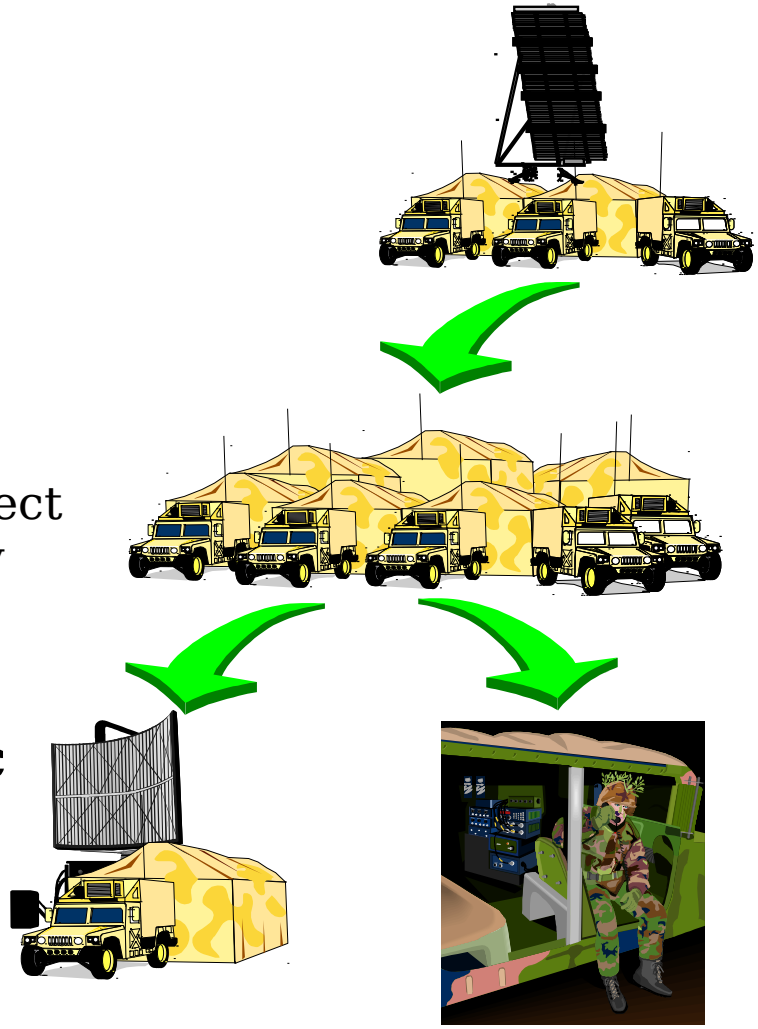
- MS I, 22 Aug 00
- Raytheon N&MIS, Prime Contractor, May 01
- IPPD teaming implemented
- Executed PDRR plan
- Established CAC2S integrated lab at N&MIS facility
- Refined Acquisition Strategy and supporting documents
- Briefed/demonstrated PDRR progress to MACCS OAG, Sep 01 and Apr 02
- Number one priority program of DC/A

CAC2S Increments

Increment I - Hardware and software replacement for the core MACCS requirements and the Tactical Air Operations Center (TAOC) functionality

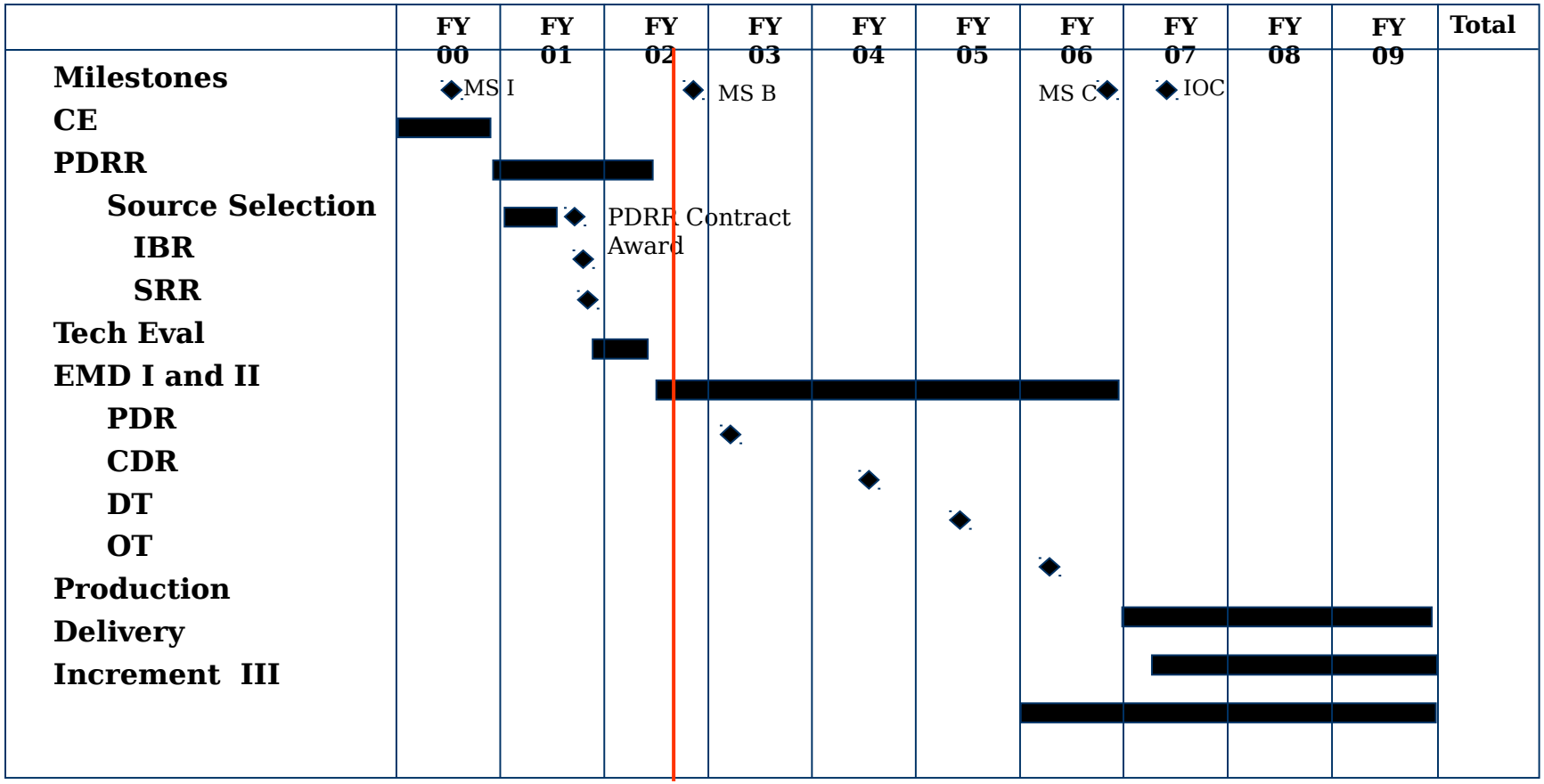
Increment II - Tactical Air Command Center (TACC) functionality and the Direct Air Support Center (DASC) functionality

Increment III - Marine Air Traffic Control (ATC) C2 integration



MAGTF OC Vision

CAC2S Macro Program Schedule



Raytheon CAC2S Team

GENERAL DYNAMICS
Decision Systems

- COMMUNICATIONS
- S/W DEVELOPMENT
- TECHNOLOGY INSERTION
- AIRSPACE MANAGEMENT
- MULTI-LEVEL SECURITY
- INFRASTRUCTURE

Raytheon

- N&MIS, C3I, RTSC
- PROGRAM MANAGEMENT
- SYSTEMS ENGINEERING
- SYSTEMS INTEGRATION
- TOC LEADERSHIP
- INFRASTRUCTURE
- SIAP (SSDS and CEC Compone
- S/W DEVELOPMENT

KONGSBERG
DEFENCE & AEROSPACE

- WEAPON CONTROL

Sensis CORPORATION

- SENSOR INTEGRATION

Gallium

- HUMAN SYSTEM INTERFACE

DHS SYSTEMS LLC

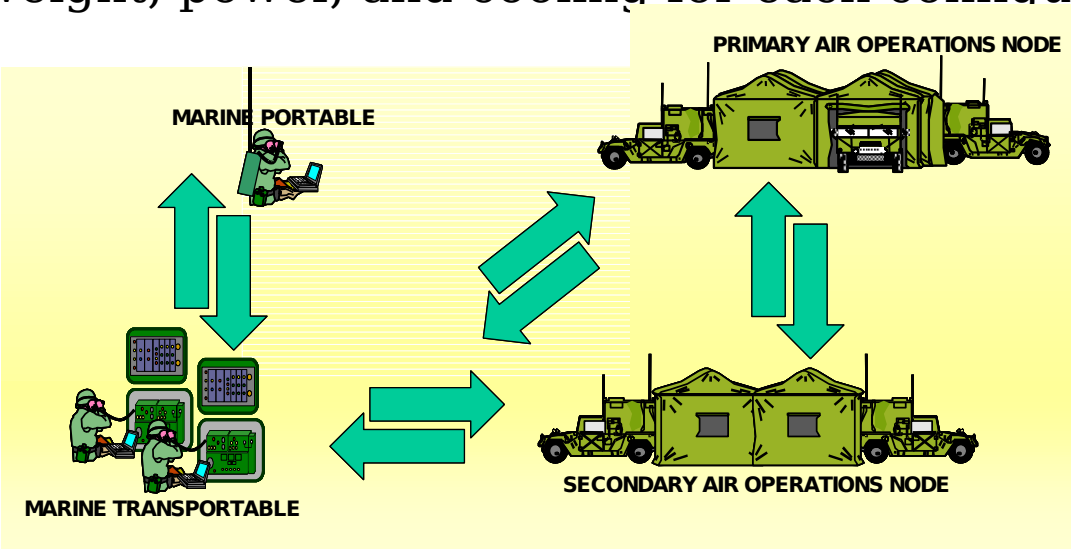
- DRASH Tent

PDRR Technical Goals

- Core system defined (functional baseline)
- Contractor's (Raytheon's) development capability shown to be achievable through demonstrations
  - Expandable, modular and scalable hardware and software architecture
  - Track Data Engine capable of fusing track information between multiple real-time systems as well as real-time and non-real-time systems
  - Functional layout of the human system interface for system operators
  - A communications system architecture and bandwidth management design for the nodal communications
- Contractor developed cost model for core and increments
- Software Development Plan

Modular, Scalable, Expandable Demo

- Hardware scalability was demonstrated through the use of CAD/CAM drawings of actual equipment, and a database driven application that automatically tabulated component count, cabling, weight, power, and cooling for each configuration.



- The Software portion took a functional approach to each of the mission areas supported in each configuration and sized the laptops and server assets necessary to host the software supporting those mission functions.

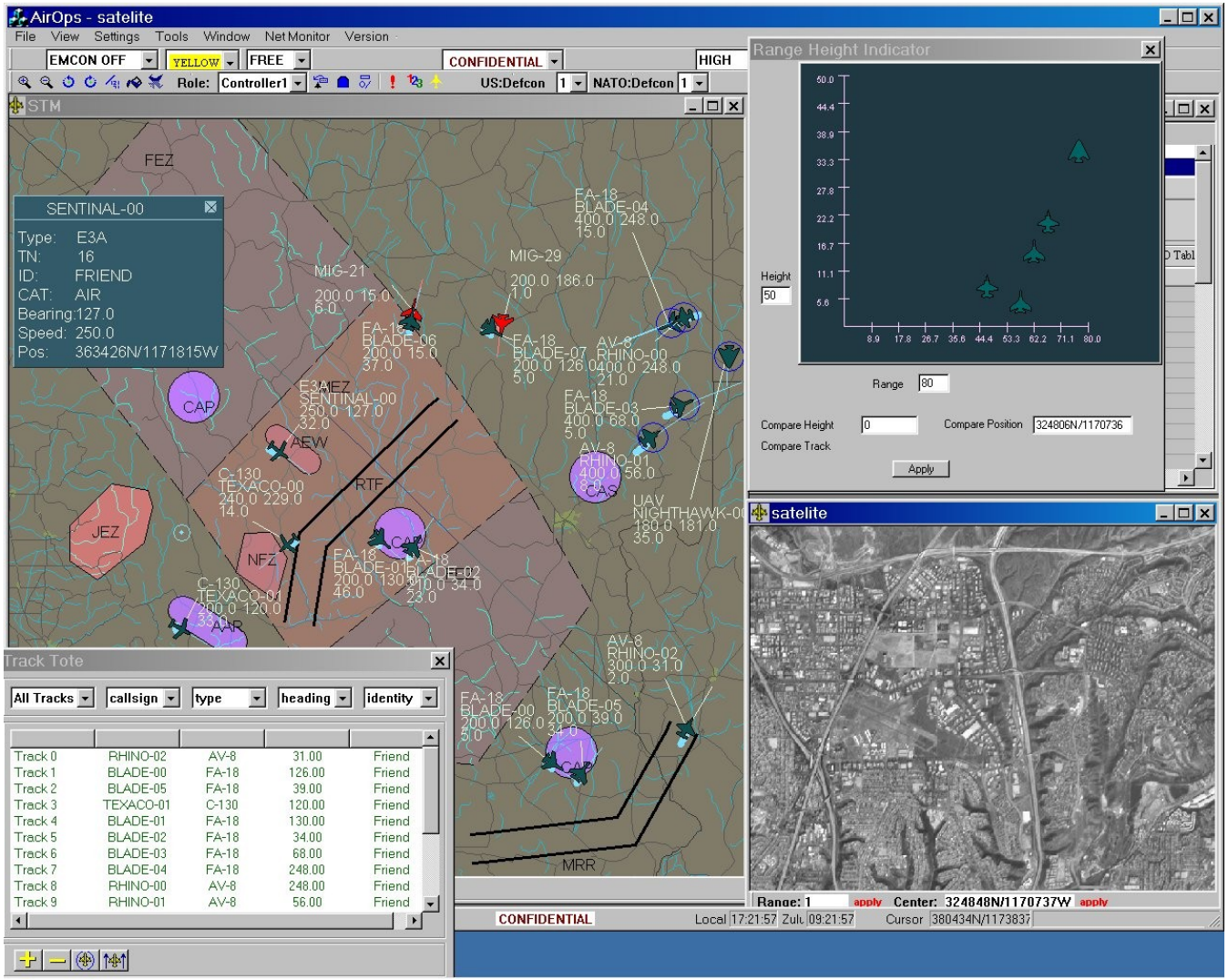
Track Data Engine Demo

- The Contractor's approach was to utilize components from the intended EMD architecture and to perform an Initial Track Integration Demonstration
- All input data was provided realistic error factors to represent the fidelity of the real world sensors
- A Government-developed realistic scenario representing a Joint operation was used as the basis of the demonstration
- The Track Data Engine Demonstration System was instrumented at all data recording points, and a reduction system implemented to allow analysis of the captured data

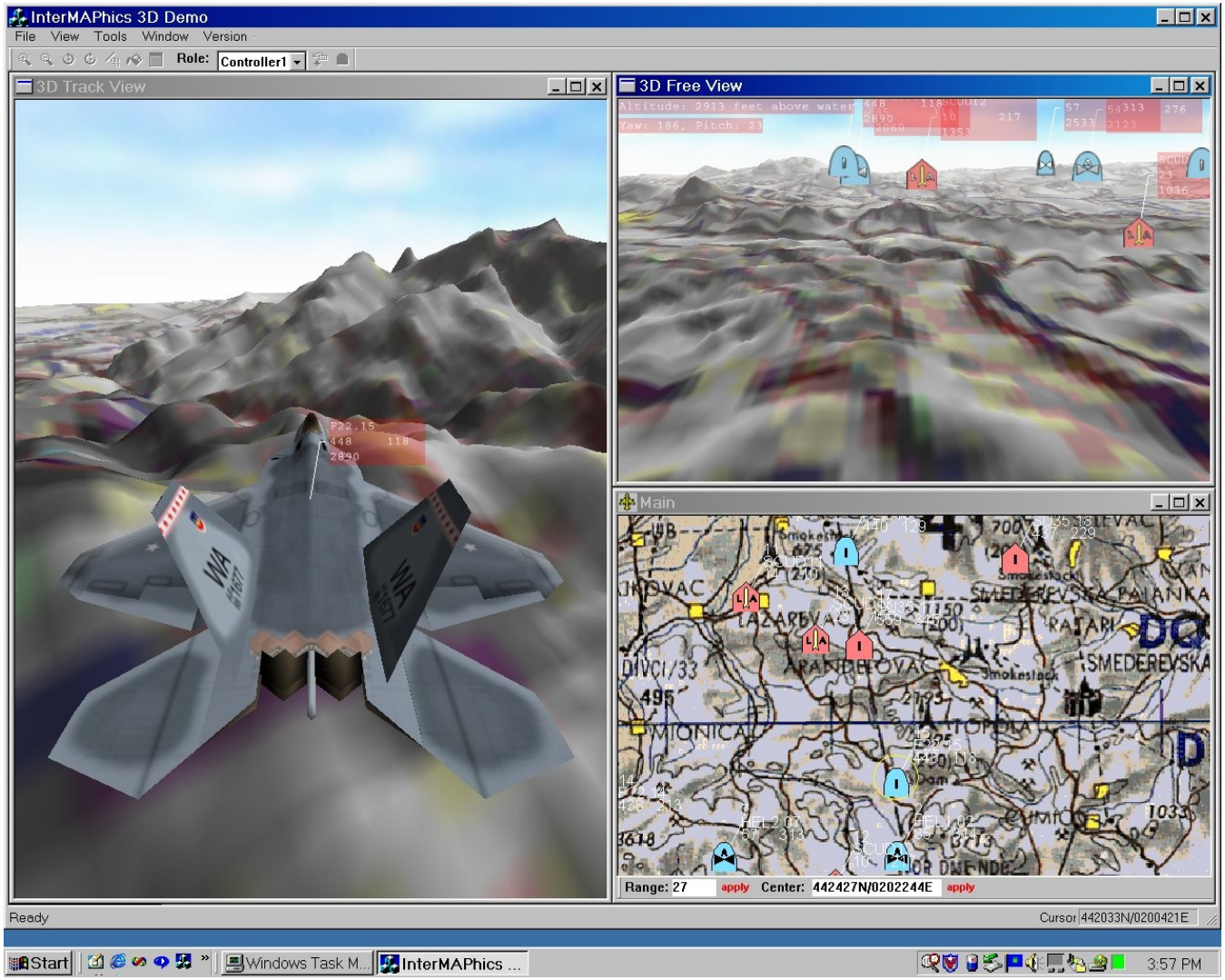
Human Systems Interface (HSI) Demo

- Developed using the Gallium InterMAPhics product and iteratively solicited feedback from CAC2S fleet introduction team members
- Proceeded through Map Server, Track Display, Track Overlays, and Typical Warfighter Console Mode phases
- Demonstrated many of the latest techniques including: Responsive Global Map Tiling using demanding NIMA formats, “Invisible” and Programmable Amplifying Track Data Blocks, Transparent Weather Overlays, Integrated Video and Web Browser, and a Real Time 3D capability
- The HSI Demo was in all cases the most impressive of the on-going demonstration developments, consistently exceeding Government requirements for the demonstration

HSI Demo - 2D


AirOps - satelite
File View Settings Tools Window Net Monitor Version
EMCON OFF
YELLOW
FREE
CONFIDENTIAL
HIGH
Role: Controller1
US:Defcon 1
NATO:Defcon 1
STM
FEZ
SENTINAL-00
Type: E3A
TN: 16
ID: FRIEND
CAT: AIR
Bearing:127.0
Speed: 250.0
Pos: 363426N/1171815W
MIG-21
200.0 15.0
6.0
MIG-29
200.0 186.0
1.0
FA-18
BLADE-04
400.0 248.0
15.0
FA-18
BLADE-06
200.0 15.0
37.0
FA-18
BLADE-07
200.0 126.0
5.0
AV-8
RHINO-00
400.0 248.0
21.0
E3A
SENTINAL-00
250.0 127.0
32.0
CAP
AEW
FA-18
BLADE-03
400.0 68.0
5.0
AV-8
RHINO-01
400.0 56.0
8.0
CAS
C-130
TEXACO-00
240.0 229.0
14.0
RTF
UAV
NIGHTHAWK-00
180.0 181.0
35.0
JEZ
NFZ
FA-18
BLADE-01
200.0 130.0
46.0
FA-18
BLADE-02
210.0 34.0
23.0
C-130
TEXACO-01
200.0 120.0
33.0
AAR
AV-8
RHINO-02
300.0 31.0
2.0
FA-18
BLADE-00
200.0 126.0
5.0
FA-18
BLADE-05
200.0 39.0
34.0
CAP
MRR
Range Height Indicator
Height
50
Range
80
Compare Height
0
Compare Position
324806N/1170736
Compare Track
Apply
satelite
Range: 1
apply
Center: 324848N/1170737W
apply
Track Tote
All Tracks
callsign
type
heading
identity
Track 0 RHINO-02 AV-8 31.00 Friend
Track 1 BLADE-00 FA-18 126.00 Friend
Track 2 BLADE-05 FA-18 39.00 Friend
Track 3 TEXACO-01 C-130 120.00 Friend
Track 4 BLADE-01 FA-18 130.00 Friend
Track 5 BLADE-02 FA-18 34.00 Friend
Track 6 BLADE-03 FA-18 68.00 Friend
Track 7 BLADE-04 FA-18 248.00 Friend
Track 8 RHINO-00 AV-8 248.00 Friend
Track 9 RHINO-01 AV-8 56.00 Friend
CONFIDENTIAL
Local 17:21:57 Zulu 09:21:57
Cursor 380434N/1173837

HSI Demo - 3D


InterMAPhics 3D Demo
File View Tools Window Version
Role: Controller1
3D Track View
3D Free View
Main
Range: 27 apply Center: 442427N/0202244E apply
Ready
Cursor 442033N/0200421E
Start
Windows Task M...
InterMAPhics ...
3:57 PM

Communications Bandwidth Management Demo

- Demo through analysis only
- Accomplished in two major phases (Intra- and Inter-Nodal) using the OPNet Communications Modeling Tool
- Used MACCS Inter-agency Lay Down (as defined by the MAWTS-1 WTI Comm Plan) as the basis for the Inter-Nodal Model
- Intra-Nodal Phase results: VOIP and CTP Data Latency acceptable using current architecture
- Inter-Nodal Phase Results: Indicated Acceptable performance for high bandwidth connectivity and Marginal performance for medium bandwidth connectivity
- Inter-Nodal Study also evaluated CTP distribution and effects of QoS schemes

ACAT II Recent Events

- 10 June meeting with BG Feigley
- Delivered ACAT transition letter to PA&E
- 18 June NavCompt freezes FY02 and FY03 funds
- 19 June met with Ms Cewe ASN/RDA (PP&R)
- 20 June met with Raytheon to discuss ACAT transition
- 21 June sent updated ACAT transition letter and APB to Ms. Cewe for advanced review
- Began update of AS/AP & APB (to include Increment III).
- 25 June met with Col Jensen, DASN Expeditionary Force Programs
- 24 July ACAT transition letter forwarded to ASN (RDA) by MARCORSYSCOM

CAC2S: What's Happening Now?

- Programmatic Activities:
  - CAC2S Program Office submitted ACAT transition letter to ASN(RD&A)
  - Milestone B documentation prep
  - Milestone B Scheduled: Week of 23 September
- Raytheon Activities:
  - Implementation of initial IMP/IMS events that were products of PDRR
  - Capitalize on sequential engineering risk reduction activities that maintain program progress and schedule

Questions ?